



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/298,751	04/23/1999	SENG-KHOON TNG	ICEN-P001	2402

7590 02/25/2004

Susan Yee  
CARR & FERRELL  
2225 EAST BAYSHORE ROAD  
SUITE 200  
PALO ALTO, CA 94303

EXAMINER
----------

ODLAND, DAVID E

ART UNIT	PAPER NUMBER
----------	--------------

2662

21

DATE MAILED: 02/25/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/298,751

Applicant(s)

TNG ET AL.

Examiner

David Odland

Art Unit

2662

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 22 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION**

***Response to Amendment***

1. The following is a response to the amendments filed on 12/22/2003.

***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 7, and 11-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nguyen (USPN 6,308,189), hereafter referred to as Nguyen, in view of Moore (USPN 4,786,893), hereafter referred to as Moore.

Referring to claim 1, Nguyen discloses an electronic switching apparatus (a vector word shift mechanism (see figure 3A)) comprising:

a circuit configured to receive at least one input signal from at least one input endpoint (barrel shifters which receives input signals (see items 305 and 306 in figure 3A)), the first circuit having at least one pair of barrel shift registers coupled to at least one of the at least one input endpoint and configured to receive the at least one input signal (two barrel shifters receive input signals and are inherently coupled to an input endpoint (see items 301 and 302 in figure 3A)), the first circuit configured to shift and rotate the at least one input signal and further configured to transmit at least one input signal (the input signals are shifted and rotated and outputted (see figure 3A and column 3 lines 62-67 and column 4 lines 1-4)) and

Art Unit: 2662

a second circuit connected to outputs from the first circuit and configured to send at least one received signal to at least one output endpoint (a secondary circuit (i.e. the AND gates of MUX's of figure 3A and 3B) receive the data output from the barrel shifters and output the data toward an output endpoint (see figures 3A and 3B)).

Nguyen does not disclose that one of the barrel shift registers is *directly* coupled to at least one of the multiplexers. However, Moore discloses a system configuration wherein a barrel shift register is directly coupled to a multiplexer (see figure 4). It would have been obvious to one skilled in the art at the time of the invention to implement this feature of Moore in the Nguyen system because doing so would make Nguyen operate faster. Namely, Nguyen discloses the barrel shifters being connected first to an AND gate before being connected to one of the multiplexers. These AND gates have an inherent processing/lag time to which the data is subjected to. Therefore, implementing Nguyen such that the barrel shifters are directly coupled to the multiplexers, as taught by Moore, will remove the delay associated with the AND gates and allow the Nguyen system to operate faster.

Referring to claims 7 and 14, Nguyen discloses of a method for electronic signal coupling (a vector word shift mechanism (see figure 3A)), the method comprising the steps of:

receiving a first set of digital signals (a pair of barrel shifters which receive digital input signals (see items 305 and 306 in figure 3A)), the received first set of digital signals being provided to at least one pair of barrel shift registers (the received signals go through a pair of barrel shifters (see items 305 and 306 in figure 3A));

shifting and rotating the first set of digital signals (the input signals are shifted and rotated (see figure 3A and column 3 lines 62-67 and column 4 lines 1-4)); and

Art Unit: 2662

transmitting a second set of digital signals (transmitting another set of signals (see items 360 and 361 in figure 3A)), the transmitted second set of digital signals being provided from a plurality of multiplexers (the second set of signals is from plurality of multiplexers (see items 337 and 338 in figure 3A)), wherein at least one of the plurality of multiplexers is connected to at least one of the barrel shift registers such that at least one signal selected in the first set of digital signals is selectably coupled for transmission in the second set of digital signals (signals coming into barrel shifter 301 can be selected to be input into multiplexer 338 (i.e. the shifters are connected to the MUX's) and output as a part of the second signal set (see figure 3A)).

Nguyen does not disclose that at least one of the barrel shift registers is *directly* coupled to at least one of the multiplexers. However, Moore discloses a system configuration wherein a barrel shift register is directly coupled to a multiplexer (see figure 4). It would have been obvious to one skilled in the art at the time of the invention to implement this feature of Moore in the Nguyen system because doing so would make Nguyen operate faster. Namely, Nguyen discloses the barrel shifters being first connected to AND gates before being connected to the multiplexers. These AND gates have an inherent processing/lag time to which the data is subjected to. Therefore, implementing Nguyen such that the barrel shifters are directly coupled to the multiplexers, as taught by Moore, will remove the delay associated with the AND gates and allow the Nguyen system to operate faster.

Referring to claim 11, Nguyen discloses the method as discussed above. Furthermore, Nguyen discloses that the step of transmitting further comprises transmitting the at least one output signal to at least one multiplexer at different times (signals coming into barrel shifter 301

Art Unit: 2662

are output to multiplexer 338 and as a part of the second signal set at a later time than the signal was input (see figure 3A)).

Referring to claim 12, Nguyen discloses the apparatus as discussed above. Furthermore, Nguyen discloses that the barrel shift register is a loadable barrel shift register (the barrel shifters are loadable with data bits (see figure 3A)).

Referring to claim 13, Nguyen discloses the apparatus as discussed above. Furthermore, Nguyen discloses that the apparatus further comprises a plurality of multiplexer modules (the apparatus comprises a plurality of multiplexers (see items 345 and 346 of figure 3A)).

4. Claims 2,3 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nguyen in view of Moore and further in view of Cheng et al. (USPN 4,528,664), hereafter referred to as Cheng.

Referring to claim 2, Nguyen discloses the system disclosed above. Nguyen does not disclose that the input signal is configured to be received in serial form includes a plurality of data channels interleaved between them. However, Cheng discloses transmitting and receiving signals that comprise a plurality of interleaved channels in serial form (see column 3 lines 51-68). It would have been obvious to one skilled in the art at the time of the invention to receive the data in a signal of serial form wherein a plurality of data channels are interleaved therein, in the Nguyen system, because such a data format is would allow the transmit and receive lines to be shared since they are in a TDM format, thereby increasing the efficiency of Nguyen.

Referring to claim 3, Nguyen discloses the system discussed above. Furthermore, Nguyen discloses that the at least one multiplexer is configured to be selectably connected to the

Art Unit: 2662

at least one pair of barrel shift registers (a multiplexer is selectably connected to a barrel shifter (see figure 3A)) thereby effectively enabling digital signal switching between the at least one input endpoint and the at least one output endpoint (thereby the input signal is switched to an output signal which is sent toward an output endpoint (see figure 3A)). Nguyen does not disclose that the signals are switched simultaneously. However, it would have been obvious to one skilled in the art at the time of the invention to provide simultaneous switching in the system of Nguyen because doing so would make the system operate faster.

Referring to claim 5, Nguyen discloses the switching apparatus as discussed above. Furthermore, Nguyen discloses that the at least one pair of barrel shift registers is configured to interconnect a plurality of received input signals at different times (the barrel shifters interconnect input signals continuously and thus at different times (see figure 3A)).

5. Claims 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nguyen in view of Moore and further in view of Baker et al. (USPN 6347344), hereafter referred to as Baker.

Referring to claim 6, Nguyen discloses the switching apparatus as discussed above. Nguyen does not explicitly disclose that the endpoint is one of the AC97 or 12S conventions. However, Baker discloses of a system utilizing AC97 and discusses how it is a standardized protocol (see column 13 lines 36-39). Therefore, it would have been obvious to one skilled in the art at the time of the invention to implement the endpoints of Nguyen using the AC97 conventions since it is a well-known and established standard for data coding and thus using the standard would reduce the cost of having to develop a new coding format as well as allow the

Art Unit: 2662

Nguyen system to conform to an existing standard and communicate with other users of the standard.

6. Claims 4, 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nguyen in view of Moore and further in view of Phelps et al. (USPN 4,512,018), hereafter referred to as Phelps.

Referring to claims 4 and 8, Nguyen discloses that the first set of digital signals comprises a data signal that is configured to be received in either serial or parallel form (the barrel shifter receives the data in parallel form (see item 301 and 302 of figure 3)). Nguyen does not disclose that the data signal is converted to serial form when received in parallel form. However, Phelps discloses of a barrel shifter circuit, which receive signals from its parallel inputs (i.e. items A0-A3 of item 40 in figure 2), shifts them, and outputs them in serial form (i.e. output X0 of item 45). It would have been obvious to one skilled in the art at the time of the invention to use the parallel to serial conversion method as taught by Phelps in the method of Nguyen because doing so would allow the system of Nguyen to be more flexible in the types of data it receives (namely, the system of Nguyen will be able to receive parallel and/or serial data).

Referring to claim 9, Nguyen discloses the method as discussed above. Furthermore, Nguyen discloses that the first set of digital signals are transmitted as digital signals in the second set of digital signals separately at different times (the input signals to the barrel registers are multiplexed out as another set of signals on different output lines and at a time later than the signals where received (see figure 3A)).



Art Unit: 2662

7. Claims 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nguyen in view of Moore and Phelps further in view of Baker.

Referring to claim 10, Nguyen discloses the switching apparatus as discussed above. Nguyen does not explicitly disclose that the endpoint is one of the AC97 or 12S conventions. However, Baker discloses of a system utilizing AC97 and discusses how it is a standardized protocol (see column 13 lines 36-39). Therefore, It would have been obvious to one skilled in the art at the time of the invention to implement the endpoints of Nguyen using the AC97 conventions since it is a well-known and established standard for data coding and thus using the standard would reduce the cost of having to develop a new coding format as well as allow the Nguyen system to conform to an existing standard and communicate with other users of the standard.

### ***Response to Arguments***

Applicant's arguments with respect to claims 1-14 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Odland, who can be reached at (703) 305-3231 on Monday – Friday during the hours of 8am to 5pm.


Art Unit: 2662

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hassan Kizou, can be reached at (703) 305-4744. The fax number for the organization where this application or proceeding is assigned is (703) 872-9314.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist, who can be reached at (703) 305-4750.

deo

February 19, 2004

  
**JOHN PEZZLO**  
**PRIMARY EXAMINER**